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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/670,551	09/25/2003	Phillip W. Barth	10021235-1	5493

7590 11/30/2004
AGILENT TECHNOLOGIES, INC.
Legal Department, DL429
Intellectual Property Administration
P.O. Box 7599
Loveland, CO 80537-0599

EXAMINER

RICHARDS, N DREW

ART UNIT	PAPER NUMBER
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2815

DATE MAILED: 11/30/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/670,551

Applicant(s)

BARTH, PHILLIP W.

Examiner

N. Drew Richards

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 05 November 2004.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) 11-20 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3 and 5-9 is/are rejected.
- 7) ☒ Claim(s) 4 and 10 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 20 January 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 9/25/03
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Election/Restrictions

1. Applicant's election with traverse of claims 1-10 in the reply filed on 11/5/04 is acknowledged. The traversal is on the ground(s) that the claims of Group II include elements found in the claims of Group I and the search for the claims of Group I will find relevant prior art relating to the claims of Group II such that little additional searching should be required for the claims of Group II so that examining both groups does not present a serious burden. This is not found persuasive because though the search for Group I and Group II might overlap in some of the search areas, there is still a serious burden upon the examiner to search and examine both groups. The search for group I includes searching for structure and detail not necessitated for group II and the search for group II includes searching for specific method steps that are not required for group I. Further, the consideration and examination of the methodology claimed in group II is not required for the examination of group I. Thus, the examination of both groups together constitutes a serious burden on the examiner.

The requirement is still deemed proper and is therefore made FINAL.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

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3. Claims 1-3, 5, 8 and 9 are rejected under 35 U.S.C. 102(b) as being anticipated by Li et al. ("Ion-Beam Sculpting at nanometer Length Scales", Nature, Vol. 412, July 12, 2001, Pp. 166-169).

Li et al. disclose a structure for the construction of one of a microscale and nanoscale device. For example, Li et al. disclose:

a rigid frame supporting a diaphragm comprising a first material (figure 1a and explanation below figure; the silicon substrate is the rigid frame supporting the silicon nitride diaphragm), the diaphragm having an opening therethrough (single initial pore, not shown);

a region of a second material disposed in the opening and supported by the diaphragm.

Li et al. disclose in paragraph 3 on page 166, the SiN membrane (diaphragm) supported on a silicon frame (rigid frame) and a through-hole (opening). They then disclose that under ion beam exposure the hole was closing. On line 1 of page 167, they disclose that a thin membrane was grown. This thin membrane is the second material disposed in the opening and supported by the diaphragm.

With regard to claim 2, the diaphragm comprises a layer of silicon nitride.

With regard to claim 3, the second material comprises one of polyimides, photoresists, parylene, organic molecules, inorganic molecules, metals, and insulators. Since organic molecules, inorganic molecules, metals and insulators include all the materials of Li et al.'s structure, the second material must necessarily be included in the claimed group.

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With regard to claim 5, the nanoscale device is a nanopore.

With regard to claim 8, Li et al. discloses a width of the diaphragm being about 40 micrometers. Li et al. disclose their diaphragm being 25x25 micrometers. If this were square, the diagonal would be 35.35 (using $a^2 + b^2 = c^2$) micrometers. If the shape were skewed such as a parallelogram, the long diagonal would measure greater than that of the square. As such, the smallest value for the maximum width (along the diagonal) is 35.35. This width is considered to read on the claimed "about" 40. The term "about" renders the claim broad such that 35.35 is considered "about" 40.

With regard to claim 9, the diaphragm is in tension (the silicon nitride is disclosed as being in under tensile stress, and thus in tension, on line 4 of the description below figure 1).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 6 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Li et al. as applied to claims 1-3, 5 and 9 above.

With regard to claims 6 and 7, Li et al. does not explicitly teach the silicon nitride layer having a thickness of 100-300 nm and specifically about 200 nm. Li et al. teach their silicon nitride having a thickness of 500 nm.

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Nonetheless, the claimed dimensions (thickness) are considered obvious over Li et al.

These claims are prima facie obvious without showing that the claimed ranges achieve unexpected results relative to the prior art range. In re Woodruff, 16 USPQ2d 1935, 1937 (Fed. Cir. 1990). See also In re Huang, 40 USPQ2d 1685, 1688 (Fed. Cir. 1996) (claimed ranges of a result effective variable, which do not overlap the prior art ranges, are unpatentable unless they produce a new and unexpected result which is different in kind and not merely in degree from the results of the prior art). See also In re Boesch, 205 USPQ 215 (CCPA) (discovery of optimum value of result effective variable in known process is ordinarily within skill of art) and In re Aller, 105 USPQ 233 (CCPA 1955) (selection of optimum ranges within prior art general conditions is obvious). It would have been obvious to one of ordinary skill in the art to form the silicon nitride layer to about 200 nm thick in order to save time of deposition (takes less time to deposit a thinner layer) and money on materials.

Allowable Subject Matter

6. Claims 4 and 10 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

7. The following is a statement of reasons for the indication of allowable subject matter: the prior art of record fails to teach, disclose, or suggest, either alone or in

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combination, a structure as claimed where either (a) the second material comprises polyimide, or (b) the opening has a diameter of about 5 micrometers.

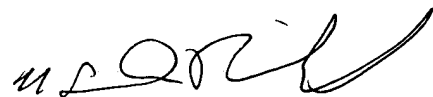
Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Knoll (U.S. Patent No. 5,393,401), Montemagno et al. (U.S. Patent No. 6,686,299 B2).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to N. Drew Richards whose telephone number is (571) 272-1736. The examiner can normally be reached on Monday-Friday 9:00-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Thomas can be reached on (571) 272-1664. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



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